Effluent Quality Assessment of

Marsh Cove WWTF

Nassau County

NPDES # FL0032654

Sampled February 5, 2018

March 2019

Biology Program

DEP Laboratory

Division of Environmental Assessment and Restoration

DEP Laboratory Quality Manual

NELAC Certification No. E31780

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Summary of Results

The effluent sample collected from the EFD-02 NPDES sampling point for this facility on February 05, 2018, was not acutely toxic to the *Ceriodaphnia dubia* test organisms during the 96-hour acute definitive bioassay but was moderately acutely toxic to the *Cyprinella leedsi* test organisms, producing 35% mortality in the 100% effluent concentration. There was an insufficient volume of sample to perform both a freshwater and salinity adjusted algal growth potential (AGP) test, as per the method. The effluent AGP was analyzed and the result was greater than the threshold suggested to be representative of high productivity for freshwater; however, the receiving waterbody is marine. Further testing may be needed to determine if the effluent may contribute to the nutrient loading in the receiving waters. All measured parameters complied with effluent permit limits, Class II Marine Water Quality Criteria, and Class III Marine Water Quality Criteria (32-302.530 F.A.C.).

Facility Overview

Marsh Cove Wastewater Treatment Facility (WWTF) is an activated sludge domestic wastewater treatment facility. A Facility Summary, including a description of the facility, summary of permit limits, and any relevant Administrative Order (AO), Consent Order (CO), and Discharge Monitoring Report (DMR) information is provided in Appendix A.

Highway A1A is the boundary between a Class III Marine waterbody to the north (WBID 2124A, Amelia River) and a Class II Marine waterbody to the south (WBID 2149A, South Amelia River). Note that WBID 2140A, as listed in the Facility Summary, was merged with parent WBID 2149 in Run 52 to become WBID 2149A. Outfall D-002 discharges south of Highway A1A into a Class II Marine waterbody and within the boundary for the Nassau Valley State Reserve, an Outstanding Florida Waterbody. This is within the Lower Nassau River Estuary Numeric Nutrient Criteria (NNC) Region (see map). The NNC thresholds for this region, expressed as annual geometric means (AGM), are 0.107 mg/L total phosphorus and 0.80 mg/L total nitrogen. The NNC for chlorophyll *a* is 17.5 µg/L and is expressed as a value that shall not be exceeded in more than 10 percent of the measurements (62-302.532(u)(2), F.A.C.). This FYI event can only provide single sample results; therefore, compliance should be determined with additional sampling events.
http://ca.dep.state.fl.us/mapdirect/?focus=nutrientcriteria

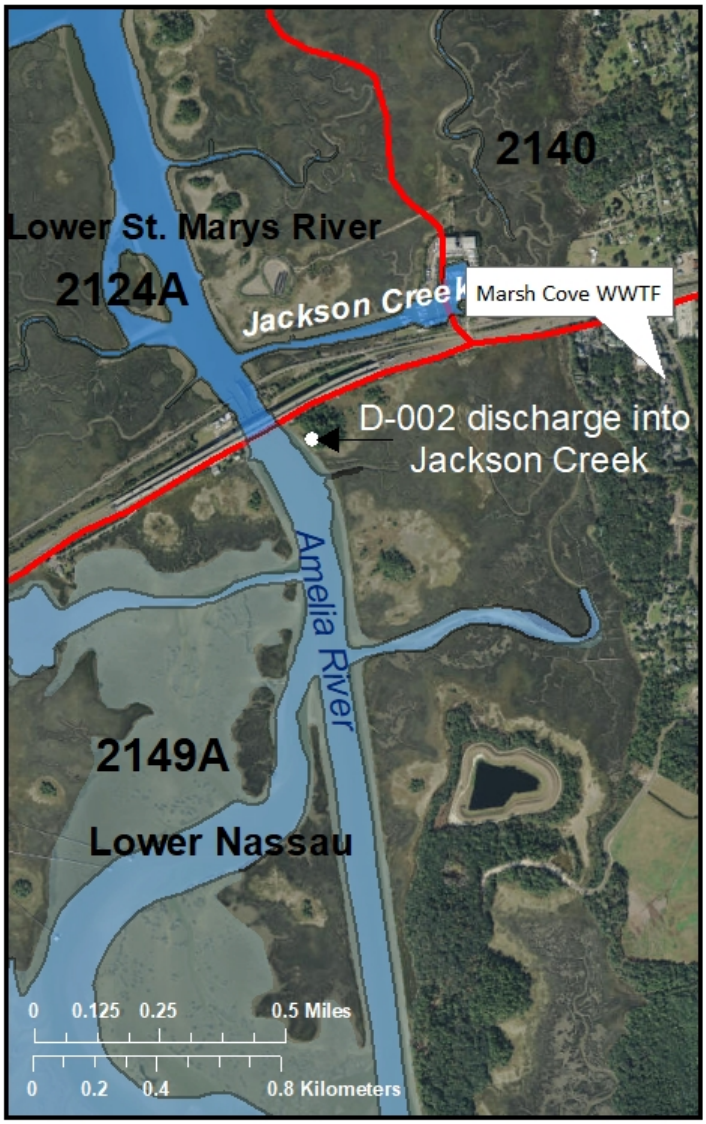
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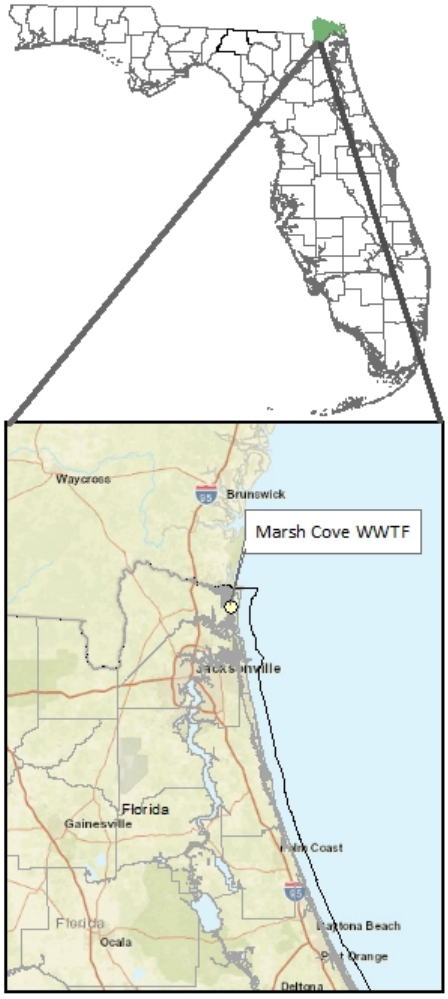
Effluent grab samples for toxicity testing, biological analyses, and chemical analyses were collected on February 05, 2018. All samples were collected from the EFD-02 NPDES sampling point for Outfall D-002 by Brittany Dion and Nick Williams (DEP Northeast Regional Operation Center). The permit listed the receiving water as Class III Marine but further investigation revealed D-002 discharges into a Class II Marine waterbody. Measured parameters for this report are compared to Class II Marine Criteria in the tables and noted in the text or footnotes if Class III Criteria were different.

All field and laboratory methods followed DEP Standard Operating Procedures (see https://floridadep.gov/dear/quality-assurance/content/dep-sops and https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-manual-and-sops for details) and met DEP quality assurance/quality control standards (see https://floridadep.gov/dear/quality-assurance). Explanations of specific methods and measurements can be found in Appendix B.

All references to 62-302.530, F.A.C. are to the surface water quality criteria table with an effective date of 02/17/2016 and a notice identification number of 17115667.

Map: Marsh Cove WWTF, 123 West Hirth Road, Fernandina Beach, Nassau County, Florida, 32034. NPDES #FL0032654.





Nassau County on Border of Florida/Georgia

Marsh Cove WWTF

Fifth year inspection

FL0032654

Map produced on 2/25/19 by Lisa Homann

N W E S

Results

Physical and Chemical Parameters / Site Characterization (See Table 1 and Appendix A)

- Effluent physical and chemical parameters complied with effluent permit limits, Class II Marine Water Quality Criteria, and Class III Marine Water Quality Criteria (32-302.530 F.A.C.).

Analytical Water Chemistry (See Table 2 and Appendix C)

- Total residual chlorine (TRC) and total ammonia were not detected in the bioassay sample in the laboratory. Compliance for TRC cannot be determined based on these results. The laboratory equipment method detection limit is higher than the Class II and Class III Marine Water Quality Criterion (62-302.530(18), F.A.C.). The holding time requirement of 15 minutes for measuring TRC was also exceeded.
- The total ammonia concentration in the grab sample collected and preserved for chemical analysis was 1.4 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was <0.02 mg/L.
- Fluoride and turbidity were detected in the effluent at levels that comply with Class II and Class III Marine Water Quality Criteria (62-302.530, F.A.C.). Carbonaceous biological oxygen demand, nickel, and total suspended solids were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

Toxicity Test Results (See Table 2 and Appendix C)

- Tests were performed February 6 through 10, 2018.
- Acute bioassay results are reported as the Concentration Lethal to 50% of the test organisms (LC50). In a 96-hour acute definitive test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule and 62-302.500(1)a, F.A.C.). Mortality between 20 and 50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).
- For the 96-hour acute definitive bioassay, the calculated LC50 for *Ceriodaphnia dubia* was greater than 100% effluent with 0% mortality in 100% sample. The calculated LC50 for *Cyprinella leedsi* was greater than 100% effluent with 35% mortality in 100% sample.
- The bioassay sample was not acutely toxic to the *Ceriodaphnia dubia* test organisms but was moderately acutely toxic to the *Cyprinella leedsi* test organisms.
- For more information or to obtain copies of the toxicity bench sheets, please contact the Biology Laboratory at 850-245-8177.

Metals (See Table 3 and Appendix C)

- Aluminum, copper, and zinc were detected in the effluent sample at levels that comply with Class II and Class III Marine Water Quality Criteria (62-302.530, F.A.C.).

Algal Growth Potential (See Table 4 and Appendix C)

- There was an insufficient volume of sample to perform a freshwater Algal Growth Potential (AGP) test and a salinity adjusted AGP test per the method.
- The effluent freshwater AGP was 25.0 A mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum.* The analytical chemistry suggests that the effluent is phosphorus limited (Miller et al. 1978).
- While the effluent AGP result is less than the predicted results based on the chemistry of the water, it is greater than the AGP range suggested to be representative of high productivity for freshwater (6.10 to 20.0 mg dry wt/L; Miller et al. 1978). By comparing the laboratory AGP result to the predicted AGP values for inorganic nitrogen, total nitrogen, ortho-phosphate, and total phosphorus, an inference can be made that not all of the nutrients in the effluent were bio-available to the test species. To determine actual nutrient limitation, a limiting-nutrient algal growth potential test should be performed (Maloney et al. 1978).

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Stevenson, R. J. and L. L. Bahls. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protection Agency, Office of Water, Washington, D. C.

USEPA. 2002. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 5th edition. EPA-821-R-02-012.

USEPA. 2000. Nutrient Criteria Technical Guidance Manual – River and Streams. EPA-822-B-00-002.

Table 1. Effluent limits, Class II Marine Criteria and field parameters.

Marsh Cove	Units	Class II Criteria	Effluent Permit Limits	Marsh Cove Grab
Sample Depth	ft	-	-	1
Temperature	C	-	-	17.0
pH	SU	6.5 - 8.5	6.5 - 8.5	7.1
Specific Conductance	µmhos/cm	-	-	869
Salinity	ppt	-	-	0.43
Dissolved Oxygen	mg/L	-	≥ 5.0	-
Dissolved Oxygen	% Saturation	≥ 42	-	97.6

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

Table 2. Effluent limits, Class II Marine Criteria and analytical water chemistry data.

Marsh Cove	Units	Class II Criteria	Effluent Permit Limits	Marsh Cove Grab
Ortho-phosphate	mg P/L	-	Report	0.11 Y
Total Phosphorus	mg P/L	0.107[1]	≤ 6.0	0.12
Total Ammonia	mg N/L	-	-	1.4
Un-ionized Ammonia (calculated salinity)	mg NH_3/L	-	-	< 0.02 c
Nitrate and Nitrite	mg N/L	-	Report	0.89
Total Kjeldahl Nitrogen	mg N/L	-	Report	2.0
Organic Nitrogen	mg N/L	-	Report	0.6 c
Total Nitrogen	mg N/L	0.80[1]	≤ 9.0	2.9 c
Total Organic Carbon	mg C/L	-	-	6.8 A
Chlorophyll *a* - Corrected	µg/L	17.5[2]	-	0.55 U
Phaeophytin	µg/L	-	-	0.40 U
Chlorophyll *a* - Uncorrected	µg/L	-	-	0.40 U
CBOD, 5 day, N - inhibited	mg/L	-	≤ 40	1.2 I
Total Residual Chlorine	mg/L	≤ 0.01	≤ 0.01	≤ 0.03[3]
Total Suspended Solids	mg/L	-	≤ 40	2 I
Turbidity	NTU	< 29 t	-	0.30
Color (true)	PCU	-	-	12
Alkalinity	mg$CaCo_3$/L	-	-	94 A
Chloride	mg Cl/L	≤ 10%[4]	-	77 A
Cyanide	µg/L	≤ 1.0	-	-
Fluoride	mg F/L	≤ 1.5[5]	-	0.32
Sulfate	mg SO_4/L	-	-	220 A
Microbiology				
Fecal Coliforms [6]	cfu/100 mL	-	≤ 800 s	2 UY
Escherichia coli[6]	MPN/100 mL	-	-	10 UY
Toxicity (96-hour Acute Definitive and Screen, LC50 % effluent)				
Bioassay - Water flea *(Ceriodaphnia dubia)*	% effluent	≥ 100	≥ 100	> 100
Bioassay - Fish *(Cyprinella leedsi)*	% effluent	≥ 100	≥ 100	> 100

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist

c - Value is calculated

s - Single sample

t - Shall not exceed 29 NTUs above background

A - Value reported is the mean of two or more determinations

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

U - Material analyzed for but not detected; value reported is the method detection limit

Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.

1 - Lower Nassau Estuary Region Numeric Nutrient Criteria (NNC), expressed as annual geometric mean (62-302.532(u)(2) F.A.C.).

2 - Lower Nassau Estuary Region Numeric Nutrient Criteria (NNC). Criterium shall not be exceeded in more than 10 percent of the measurements (62-302.532(u)(2) F.A.C.).
3 - Measurement taken in the DEP Toxicology laboratory for Tox analysis. MDL of colorimeter is 0.03 mg/L.
4 - Shall not exceed 10% mg Cl/L above background.
5 - Class III Marine Water Quality Criterium is less than or equal to 5.0 mg F/L (62-302.530(32) F.A.C.).
6 - Fecal coliform and *Escherichia coli* analyses performed by ALS Environmental, Jacksonville, laboratory.

Table 3. Effluent limits, Class II Marine Criteria and analytical metals data.

Marsh Cove	Units	Class II Criteria	Effluent Permit Limits	Marsh Cove Grab
Hardness	mg $CaCO_3$/L	-	-	289 c
Aluminum	µg/L	≤ 1500	-	36
Arsenic	µg/L	-	-	0.37
Cadmium	µg/L	≤ 8.8	-	0.020 U
Calcium	mg/L	-	-	63.1
Chromium, Total[7]	µg/L	≤ 50	-	0.40 U
Copper	µg/L	≤ 3.7	-	0.83[8]
Iron	µg/L	≤ 300	-	30 U
Lead	µg/L	≤ 8.5	-	0.050 U
Magnesium	mg/L	-	-	31.8
Nickel	µg/L	≤ 8.3	-	0.75 I
Potassium	mg/L	-	-	12.1
Selenium	µg/L	≤ 71	-	0.20 U
Silver	µg/L	≤ 2.3	-	0.010 U
Sodium	mg/L	-	-	66.3
Zinc	µg/L	≤ 86	-	48

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

c - Value is calculated

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

U - Material analyzed for but not detected; value reported is the method detection limit

7 - Class II and Class III Marine Water Quality Criterion (62-302.530(19)(b), F.A.C.) is for chromium-VI

8 – Analyte was detected in both sample and field blank (0.30 I µg/L copper).

Table 4. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

Marsh Cove								
Location	**Test Species**	**AGP (measured)**	**Predicted AGP (TSIN) ± 20%**	**Predicted AGP (OP) ± 20%**	**Predicted AGP (TN) ± 20%**	**Predicted AGP (TP) ± 20%**	**Inorganic N:P ratio**	**Total N:P ratio**
Marsh Cove Grab	*Pseudokirchneriella subcapitata*	25.0 A	87 ± 17.4	47.3 ± 9.5	109.8 ± 22	51.6 ± 10.3	20.8	24.1

A - Value reported is the mean of two or more determinations

Appendix A

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event

Prepared By: Hillary Saunders	**Contact Number:** (904) 256-1549
Facility Name (as it appears on permit): Marsh Cove WWTF	**Former Names:**
NPDES Permit Number: FL0032654	**Permit Expiration Date:** December 10, 2018
Physical Address: 123 West Hirth Road	
District: Northeast	**County:** Nassau
Function of Facility: Domestic, advanced wastewater treatment plant	
Facility Type: Domestic Wastewater	**Permitted Capacity (MGD):** 0.050 MGD (annual average flow)
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): November 2016 through November 2017 mean flow = .021 MGD at D002	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): NA	
Description of type of Discharge: ☒ **Continuous** ☒ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify:**	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): EFD-2 - Effluent sample immediately after dechlorination and prior to discharge to Jackson Creek. EFA- 2 - Effluent sample point immediately after disinfection and prior to dechlorination FLW-1 – 2" propeller flow meters on the force-main discharge piping	
Description of Permitted Outfall(s): The discharge D-002 outfall is approximately 4000 feet in length and the point of discharge is located approximately at latitude 30 ° 37' 44" N, longitude 81 ° 28' 23" W. in Jackson Creek.	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): An existing 0.050 million gallons per day (MGD) annual average daily flow (AADF) design capacity activated sludge domestic wastewater treatment facility (WWTF) operating in extended aeration mode with biological nutrient removal (BNR) capability. The treatment facility consists of an on-site lift-station, an influent bar-screen, a 33,495-gallon aerated equalization basin, an 18,425-gallon anoxic basin, a 41,900-gallon aeration basin, a 15,100-gallon secondary dual-hopper clarifier, dual tertiary sand filters (84-ft_2 total filter area), a 6,370-gallon clear well, a 3,100-gallon chlorine contact chamber, a 13,819-gallon aerobic digester and an on-site effluent pump-station. Chlorinated reclaimed water from the wastewater treatment process is de-chlorinated by injection of liquid sodium bisulfate into the effluent force-main prior to surface water discharge. Flow is measured by two 2" propeller flow meters on the force-main discharge piping. The permitted capacity of the wastewater treatment facility is limited to 0.0499 MGD AADF at the request of the permittee due to low influent flows.	

PART I: Continued

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D-002 to Jackson Creek (WBID# 2140A). Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.B.6:

			Effluent Limitations				Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Flow	MGD	Max	0.0499	Report	-	-	5 Days/Week	Meter	FLW-1	See I.A.3
Percent Capacity (TMADF/Permitted Capacity) x 100	Percent	Max	-	Report (Monthly Total)	-	-	Monthly	Calculated	CAL-1	See I.A.9
BOD, Carbonaceous 5-day, 20ºC	mg/L	Max	20.0	25.0	30.0	40.0	Monthly	Grab	EFD-2	
Solids, Total Suspended	mg/L	Max	20.0	25.0	30.0	40.0	Monthly	Grab	EFD-2	
pH	s.u.	Range	-	-	-	6.5-8.5	5 Days/Week	Grab	EFD-2	
Coliform, Fecal	#/100mL	Max	200	Report (Monthly Geo Mean)	-	800	Monthly	Grab	EFD-2	See I.A.4
Chlorine, Total Residual (For Disinfection)	mg/L	Min	-	-	-	1.0	5 Days/Week	Grab	EFA-2	See I.A.5
Chlorine, Total Residual (For Dechlorination)	mg/L	Max	-	-	-	0.01	Monthly	Grab	EFD-2	
Oxygen, Dissolved (DO)	mg/L	Min	-	-	-	5.0	5 Days/Week	Grab	EFD-2	See I.A.6

PART I: Continued

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge effluent from Outfall D-002 to Jackson Creek (WBID# 2140A). Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.B.6:

			Effluent Limitations				Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Nitrogen, Total	mg/L	Max	4.50	5.625	6.75	9.0	Monthly	Grab	EFD-2	
Nitrogen, Total	lb/month	Max	-	Report (Monthly Total)	-	-	Monthly	Calculated	CAL-1	
Nitrogen, Total	lb/year	Max	Report (Annual Total)	-	-	-	Monthly	Calculated	CAL-1	
Phosphorus, Total (as P)	mg/L	Max	3.0	3.75	4.50	6.0	Monthly	Grab	EFD-2	
Phosphorus, Total (as P)	lb/month	Max	-	Report (Monthly Total)	-	-	Monthly	Calculated	CAL-1	See I.A.7
Phosphorus, Total (as P)	lb/year	Max	Report (Annual Total)	-	-	-	Monthly	Calculated	CAL-1	See I.A.7
Copper, Total Recoverable	µg/L	Max	-	-	-	3.7	Monthly	Grab	EFD-2	
Nitrogen, Kjeldahl, Total (as N)	mg/L	Max	-	-	-	Report	Semi-annually	Grab	EFD-2	
Nitrogen, Organic, Total (as N)	mg/L	Max	-	-	-	Report	Semi-annually	Grab	EFD-2	
Nitrite plus Nitrate, Total 1 det. (as N)	mg/L	Max	-	-	-	Report	Semi-annually	Grab	EFD-2	

Phosphate, Ortho (as P)	mg/L	Max	-	-	-	Report	Semi-annually	Filtered Grab	EFD-2	
Acute Whole Effluent Toxicity, 96-hr LC50 (*Ceriodaphnia dubia* & *Cyprinella leedsi*)	Percent	Min	-	-	-	100	Semi-annually	Grab	EFD-2	See I.A.9

I.A.3. A meter shall be utilized to measure flow and calibrated at least once every 12 months. *[62-601.200(17) and .500(6)]*

I.A.4. The effluent limitation for the monthly geometric mean for fecal coliform is only applicable if 10 or more values are reported. If fewer than 10 values are reported, the monthly geometric mean shall be calculated and reported on the Discharge Monitoring Report. *[62-600.440(4)(c)]*

I.A.5. Total residual chlorine of 1.0 mg/L must be maintained for a minimum contact time of 15 minutes based on peak hourly flow. *[62-600.440(4)(b), (5)(b), and (6)(b)]*

I.A.6. Effluent dissolved oxygen levels shall never be less than 5.0 mg/L. Normal daily and seasonal fluctuation above these levels shall be maintained. *[62-302.530(30)]*

I.A.7. Discharges to Jackson Creek via outfall D-002 are subject to nutrient mass load reporting for total nitrogen (TN) and total phosphorus (TP). The monthly mass load (MML) and annual mass load (AML) of total nitrogen (TN) and total phosphorus (TP) to be reported on the DMR shall be calculated as follows;

a. Monthly Mass Load (MML)

MML (Lbs/mo) = [Flow (MG/Mon) **x (TN or TP)(**mg/L**) + x 8.34 (**L/MG**)(**Lbs/mg**)]**

Where:

MML	=	Monthly mass load of total nitrogen and total phosphorus; (Lbs/mo)
Flow	=	Total monthly volume of effluent discharged from Outfall D-002; (MG/mo)
TN	=	Monthly average concentration of TN collected at EFD-2; (mg/L)
TP	=	Monthly average concentration of TP collected at EFD-2; (mg/L)

b. The annual mass load (AML) is computed using a rolling or moving twelve (12) – month period. The calculation shall be the sum of the twelve most recent monthly mass loads of total nitrogen or total phosphorus starting from the current reporting month and eleven previous months.

I.A.9. The permittee shall comply with the following requirements to evaluate acute whole effluent toxicity of the discharge from outfall D-002.

a. Effluent Limitation

(1) In any routine or additional follow-up test for acute whole effluent toxicity, the 96-hr LC50 shall not be less than 100% effluent. [Rules 62-302.200(1), 62-302.500(1)(a)4., 62-4.244(3)(a), and 62-4.241, F.A.C.]

b. Monitoring Frequency

(1) Routine toxicity tests shall be conducted once every six months, the first starting within 60days of the effective date of this permit and lasting for the duration of this permit.

c. Sampling Requirements

(1) All tests shall be conducted on a single grab sample of final effluent.

d. Test Requirements

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five dilutions: **100%, 75%, 50%, 25%**, and **12.5%** effluent.

(2) The permittee shall conduct 96-hour acute static renewal multi-concentration toxicity tests using the daphnid, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*,concurrently.

(3) All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 5th Edition, EPA-821-R-02-012. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct acute toxicity testing in accordance with the revised method.

(4) The control water and dilution water shall be moderately hard water as described in EPA-821-R-02-012, Table 7.

PART I: Continued

Receiving Waters:	**Classification (indicate whether fresh or marine):**
Jackson Creek to Intracoastal Waterway	Class III Marine Waters

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
See Note I.A.9 above

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
NA

Facility Mixing Zone Details (if applicable):
NA

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
January 2017	Nitrogen, Total (mg/L)	4.5 (Annual Average)	4.9 mg/L
April 2017	Nitrogen, Total (mg/L)	5.625 (Monthly Average)	6.5 mg/L
May 2017	Nitrogen, Total (mg/L)	5.625 (Monthly Average)	6.1 mg/L
September 2017	Nitrogen, Total (mg/L)	6.75 (Weekly Average)	20 mg/L
September 2017	Nitrogen, Total (mg/L)	5.625 (Monthly Average)	20 mg/L
September 2017	Nitrogen, Total (mg/L)	9.0 (Maximum)	20 mg/L
September 2017	Nitrogen, Total (mg/L)	4.5 (Annual Average)	4.9 mg/L
October 2017	Nitrogen, Total (mg/L)	4.5 (Annual Average)	4.6 mg/L

Describe previous FYI and WQBEL study:
The primary substance of concern in this water body and both adjacent water bodies is, Mercury in fish. This can be a health hazard for those eating predatory fish out of this water body. However, at this time it does not appear that the facility is causing or contributing to the Mercury impairment.
The facility however has had exceedances of their nutrient limits (Total Phosphorus and Total Nitrogen), and this should be addressed before the permit is issued. Nutrients stimulate algae growth, which in turn die and start decaying in the sediment layer, and consume oxygen. The nonpoint source loads are based on in-stream water quality monitoring data. The in-stream data accounts for atmospheric deposition to the land, nonpoint source runoff, and nutrient infiltration from septic tanks.
In addition to accounting for the sources of the substances of concern, the processes that deplete dissolved oxygen should also be considered. These processes include those that consume oxygen (sinks) as well as those that generate oxygen (sources).
Based on the discharge and receiving water characteristics, it is recommended that the facility provide a planned method of nutrient removal to the Department. The reason for this recommendation is based on the multiple exceedences of both total nitrogen (TN) and total phosphorus (TP) over the past permit cycle.
It is concluded that the permit limits are appropriate for the next permit cycle, as long as the limits can be met. The limits are adequate to protect the designated uses of the waterbody. Reasonable assurance of compliance has been provided with the effluent limits and applicable surface water quality standards for each parameter of concern.

Describe previous or current Enforcement Actions (including WLs):
Most recent enforcement was in August 2013 (LFCO 13-0932) for total nitrogen exceedances from September 2012 to March 2013. This case was closed on September 11, 2014.

Describe any violations or problems noted in previous inspection:
Facility rated as “In-Compliance” in January 2015.

Discuss whether DMR trends within previous five years are improving or declining: Effluent quality data is steady except for multiple TN exceedances.
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse): NA

PART II: Sampling Event Information	
Date(s) sample collected:	**Sampler(s):**
Temperature (Deg C):	**pH (SU):**
Dissolved Oxygen (mg/L):	**Conductivity (µmhos/cm):**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination:	**Method of De-chlorination:**
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☐ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify:**	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:	

Appendix B

Explanation of Measurements

Biological assessments are prepared by DEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions. References to Rule 62-302.530, F.A.C., are to the currently applicable surface water quality criteria table with an effective date of 02/17/2016 and a notice identification number of 17115667. New limits for *Escherichia coli* (*E. coli*), enterococci, and total ammonia nitrogen were approved on 07/24/2017**.**

(1) Quality Assurance and Quality Control

DEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (DEP SOPs). All field and laboratory methods followed DEP Standard Operating Procedures (see https://floridadep.gov/dear/quality-assurance/content/dep-sops and https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-manual-and-sops for details) and met DEP quality assurance/quality control standards (see https://floridadep.gov/dear/quality-assurance).

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following DEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62.302.200(1), F.A.C., and 62-302.500(1)a, F.A.C., and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.200(5), F.A.C., and 62-302.530(20), F.A.C., and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(20), F.A.C., and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of facility permit limits. Class III Water Quality Criteria are based on *Eschericia coli* and enterococci levels (F.A.C. 62-302.530(11)(c) and (d)).

(5) Chlorophyll *a* Content

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(89), F.A.C. 62-302.530(90)(a), F.A.C., and/or 62-302.530(90)(b), F.A.C..

(6) Algal Growth Potential (AGP)

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. The AGP range of 6.10 to 20.0 mg dry wt/L is suggested to be representative of high productivity for freshwater (Miler et al. 1978). High AGP values may constitute exceedances of 62-302.530(89), F.A.C., 62-302.530(90)(a), F.A.C. and/or 62-302.530(90)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP in a low salinity sample under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related

to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(108) F.A.C. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

(7) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

Appendix C

Chemical analysis of effluent

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Marsh Cove Grab	AGP/LN	Algal Growth Potential	25.0 A	mg DryWt/L	0.3	0.9
2/5/2018	Marsh Cove Grab	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.40 U	µg/L	0.4	1.2
2/5/2018	Marsh Cove Grab	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	0.40 U	µg/L	0.4	1.2
2/5/2018	Marsh Cove Grab	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55 U	µg/L	0.55	1.7
2/5/2018	Marsh Cove Grab	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.2 I	mg/L	0.2	2
2/5/2018	Marsh Cove Grab	Overflow	Fecal Coliforms-Membrane Filter	2 UY	cfu/100 mL	2	2
2/5/2018	Marsh Cove Grab	Overflow	Escherichia Coli-Quanti-Tray	10 UY	MPN/100 mL	10	10
2/5/2018	Marsh Cove Grab	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100 L	LC50		
2/5/2018	Marsh Cove Grab	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100 L	LC50		
2/5/2018	Marsh Cove Grab	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100 L	LC50		
2/5/2018	Marsh Cove Grab	Metals	Calcium	63.1	mg/L	0.075	0.3
2/5/2018	Marsh Cove Grab	Metals	Magnesium	31.8	mg/L	0.04	0.16
2/5/2018	Marsh Cove Grab	Metals	Arsenic	0.37	µg/L	0.05	0.2
2/5/2018	Marsh Cove Grab	Metals	Cadmium	0.020 U	µg/L	0.02	0.08
2/5/2018	Marsh Cove Grab	Metals	Zinc	48	µg/L	5	20
2/5/2018	Marsh Cove Grab	Metals	Sodium	66.3	mg/L	0.5	2
2/5/2018	Marsh Cove Grab	Metals	Iron	30 U	µg/L	30	120
2/5/2018	Marsh Cove Grab	Metals	Selenium	0.20 U	µg/L	0.2	0.8
2/5/2018	Marsh Cove Grab	Metals	Copper	0.83	µg/L	0.2	0.8
2/5/2018	Marsh Cove Grab	Metals	Potassium	12.1	mg/L	0.3	1.2
2/5/2018	Marsh Cove Grab	Metals	Aluminum	36	µg/L	3	12
2/5/2018	Marsh Cove Grab	Metals	Nickel	0.75 I	µg/L	0.2	0.8
2/5/2018	Marsh Cove Grab	Metals	Chromium	0.40 U	µg/L	0.4	1.6
2/5/2018	Marsh Cove Grab	Metals	Silver	0.010 U	µg/L	0.01	0.04
2/5/2018	Marsh Cove Grab	Metals	Lead	0.050 U	µg/L	0.05	0.2
2/5/2018	Marsh Cove Grab	Nutrients	Ammonia-N	1.4	mg N/L	0.2	0.5
2/5/2018	Marsh Cove Grab	Nutrients	O-Phosphate-P	0.11 Y	mg P/L	0.004	0.01
2/5/2018	Marsh Cove Grab	Nutrients	Chloride	77 A	mg Cl/L	4	10
2/5/2018	Marsh Cove Grab	Nutrients	Organic Carbon	6.8 A	mg C/L	1	2
2/5/2018	Marsh Cove Grab	Nutrients	Fluoride	0.32	mg F/L	0.035	0.1
2/5/2018	Marsh Cove Grab	Nutrients	TSS	2 I	mg/L	2	10
2/5/2018	Marsh Cove Grab	Nutrients	NO2NO3-N	0.89	mg N/L	0.04	0.1

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Marsh Cove Grab	Nutrients	Kjeldahl Nitrogen	2.0	mg N/L	0.08	0.2
2/5/2018	Marsh Cove Grab	Nutrients	Sulfate	220 A	mg SO4/L	4	10
2/5/2018	Marsh Cove Grab	Nutrients	Total Alkalinity	94 A	mg CaCO3/L	0.65	2.5
2/5/2018	Marsh Cove Grab	Nutrients	Color (true)	12	PCU	2.5	6
2/5/2018	Marsh Cove Grab	Nutrients	Turbidity	0.30	NTU	0.1	0.13
2/5/2018	Marsh Cove Grab	Nutrients	Total-P	0.12	mg P/L	0.005	0.05
2/5/2018	Marsh Cove Grab	Pesticides	Atrazine	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	MCPP	0.0020 UJ	µg/L	0.002	0.008
2/5/2018	Marsh Cove Grab	Pesticides	Fonofos	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Hexazinone	0.028 U	µg/L	0.028	0.11
2/5/2018	Marsh Cove Grab	Pesticides	Malathion	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Metribuzin	0.021 U	µg/L	0.021	0.083
2/5/2018	Marsh Cove Grab	Pesticides	Parathion Ethyl	0.019 U	µg/L	0.019	0.075
2/5/2018	Marsh Cove Grab	Pesticides	Simazine	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Atrazine Desethyl	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Metolachlor	0.056 U	µg/L	0.056	0.22
2/5/2018	Marsh Cove Grab	Pesticides	Parathion Methyl	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	2,4-D	0.0037 IJ	µg/L	0.002	0.008
2/5/2018	Marsh Cove Grab	Pesticides	Acetaminophen	0.0080 U	µg/L	0.008	0.032
2/5/2018	Marsh Cove Grab	Pesticides	Triclopyr	0.0040 UJ	µg/L	0.004	0.016
2/5/2018	Marsh Cove Grab	Pesticides	Diazinon	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Norflurazon	0.041 U	µg/L	0.041	0.16
2/5/2018	Marsh Cove Grab	Pesticides	Butylate	0.019 U	µg/L	0.019	0.075
2/5/2018	Marsh Cove Grab	Pesticides	Disulfoton	0.0047 U	µg/L	0.0047	0.019
2/5/2018	Marsh Cove Grab	Pesticides	Ethoprop	0.0047 U	µg/L	0.0047	0.019
2/5/2018	Marsh Cove Grab	Pesticides	Mevinphos	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Sucralose	64	µg/L	0.1	0.4
2/5/2018	Marsh Cove Grab	Pesticides	Alachlor	0.056 U	µg/L	0.056	0.22
2/5/2018	Marsh Cove Grab	Pesticides	Chlorpyrifos Ethyl	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Demeton	0.022 U	µg/L	0.022	0.09
2/5/2018	Marsh Cove Grab	Pesticides	Fenamiphos	0.028 U	µg/L	0.028	0.11
2/5/2018	Marsh Cove Grab	Pesticides	Naled	0.037 U	µg/L	0.037	0.15
2/5/2018	Marsh Cove Grab	Pesticides	Phorate	0.0047 U	µg/L	0.0047	0.019
2/5/2018	Marsh Cove Grab	Pesticides	Bentazon	8.0E-04 UJ	µg/L	0.0008	0.003
2/5/2018	Marsh Cove Grab	Pesticides	Azinphos Methyl	0.019 U	µg/L	0.019	0.075

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Marsh Cove Grab	Pesticides	Prometryn	0.019 UJ	µg/L	0.019	0.075
2/5/2018	Marsh Cove Grab	Pesticides	Ametryn	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Bromacil	0.037 U	µg/L	0.037	0.15
2/5/2018	Marsh Cove Grab	Pesticides	Chlorpyrifos Methyl	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Pesticides	Metalaxyl	0.037 U	µg/L	0.037	0.15
2/5/2018	Marsh Cove Grab	Pesticides	Atrazine Desisopropyl	0.023 U	µg/L	0.023	0.092
2/5/2018	Marsh Cove Grab	Pesticides	Prometon	0.019 U	µg/L	0.019	0.075
2/5/2018	Marsh Cove Grab	Pesticides	Carbamazepine	0.20	µg/L	0.0004	0.002
2/5/2018	Marsh Cove Grab	Pesticides	Imidacloprid	0.042	µg/L	0.002	0.008
2/5/2018	Marsh Cove Grab	Pesticides	Ethion	0.0093 U	µg/L	0.0093	0.037
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Chrysene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Hexachlorobenzene	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Phenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2,4-Dinitrotoluene	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Di-n-octyl phthalate	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Diethyl phthalate	1.9 U	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Fluorene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8 U	µg/L	2.8	11
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Pentachlorophenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2,4-Dinitrophenol	14 UJ	µg/L	14	57
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 UJ	µg/L	2.8	11
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Anthracene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Butyl benzyl phthalate	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Hexachloroethane	2.8 U	µg/L	2.8	11
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Phenanthrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2,4-Dimethylphenol	9.4 U	µg/L	9.4	38
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Pyrene	0.19 U	µg/L	0.19	0.75

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2-Nitrophenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38 U	µg/L	38	150
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8 U	µg/L	2.8	11
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Fluoranthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2-Chlorophenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	4-Nitrophenol	14 U	µg/L	14	57
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 UJ	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8 U	µg/L	2.8	11
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Nitrobenzene	1.9 U	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Acenaphthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Acenaphthylene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2-Chloronaphthalene	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Benzidine	94 U	µg/L	94	380
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	µg/L	1.9	7.5
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Dimethyl phthalate	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Hexachlorobutadiene	2.8 U	µg/L	2.8	11
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Isophorone	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	Naphthalene	0.19 U	µg/L	0.19	0.75
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2,4-Dichlorophenol	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Priority Organic Pollutants	2,6-Dinitrotoluene	0.94 U	µg/L	0.94	3.8
2/5/2018	Marsh Cove Grab	Nutrients	Dissolved Oxygen	97.6	%Sat		
2/5/2018	Marsh Cove Grab	Nutrients	Temperature	17.0	C		
2/5/2018	Marsh Cove Grab	Nutrients	Specific Conductance	869	µmhos/cm		
2/5/2018	Marsh Cove Grab	Nutrients	Sample Depth	1	ft		
2/5/2018	Marsh Cove Grab	Nutrients	pH	7.10			
2/5/2018	Field Blank	Metals	Iron	30 U	µg/L	30	120
2/5/2018	Field Blank	Metals	Aluminum	3.0 U	µg/L	3	12

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Field Blank	Metals	Lead	0.050 U	µg/L	0.05	0.2
2/5/2018	Field Blank	Metals	Calcium	0.075 U	mg/L	0.075	0.3
2/5/2018	Field Blank	Metals	Cadmium	0.020 U	µg/L	0.02	0.08
2/5/2018	Field Blank	Metals	Silver	0.010 U	µg/L	0.01	0.04
2/5/2018	Field Blank	Metals	Arsenic	0.050 U	µg/L	0.05	0.2
2/5/2018	Field Blank	Metals	Chromium	0.40 U	µg/L	0.4	1.6
2/5/2018	Field Blank	Metals	Copper	0.30 I	µg/L	0.2	0.8
2/5/2018	Field Blank	Metals	Nickel	0.20 U	µg/L	0.2	0.8
2/5/2018	Field Blank	Metals	Selenium	0.20 U	µg/L	0.2	0.8
2/5/2018	Field Blank	Metals	Magnesium	0.040 U	mg/L	0.04	0.16
2/5/2018	Field Blank	Metals	Potassium	0.30 U	mg/L	0.3	1.2
2/5/2018	Field Blank	Metals	Zinc	5.0 U	µg/L	5	20
2/5/2018	Field Blank	Metals	Sodium	0.50 U	mg/L	0.5	2
2/5/2018	Field Blank	Nutrients	O-Phosphate-P	0.004 UY	mg P/L	0.004	0.01
2/5/2018	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
2/5/2018	Field Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01
2/5/2018	Field Blank	Nutrients	Total Alkalinity	0.65 U	mg CaCO3/L	0.65	2.5
2/5/2018	Field Blank	Nutrients	Fluoride	0.035 U	mg F/L	0.035	0.1
2/5/2018	Field Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005
2/5/2018	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
2/5/2018	Field Blank	Nutrients	Turbidity	0.10 U	NTU	0.1	0.13
2/5/2018	Field Blank	Nutrients	Color (true)	2.5 U	PCU	2.5	6
2/5/2018	Field Blank	Nutrients	Sulfate	0.20 U	mg SO4/L	0.2	0.5
2/5/2018	Field Blank	Nutrients	Organic Carbon	0.50 U	mg C/L	0.5	1
2/5/2018	Field Blank	Nutrients	Chloride	0.20 U	mg Cl/L	0.2	0.5
2/5/2018	Field Blank	Pesticides	Atrazine	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	MCPP	0.0020 U	µg/L	0.002	0.008
2/5/2018	Field Blank	Pesticides	Metribuzin	0.019 U	µg/L	0.019	0.076
2/5/2018	Field Blank	Pesticides	Mevinphos	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Parathion Ethyl	0.019 U	µg/L	0.019	0.076
2/5/2018	Field Blank	Pesticides	Prometon	0.019 U	µg/L	0.019	0.076
2/5/2018	Field Blank	Pesticides	Prometryn	0.019 U	µg/L	0.019	0.076
2/5/2018	Field Blank	Pesticides	Alachlor	0.057 U	µg/L	0.057	0.23
2/5/2018	Field Blank	Pesticides	Demeton	0.023 U	µg/L	0.023	0.091
2/5/2018	Field Blank	Pesticides	Ethion	0.0095 U	µg/L	0.0095	0.038

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Field Blank	Pesticides	Phorate	0.0047 U	µg/L	0.0047	0.019
2/5/2018	Field Blank	Pesticides	Sucralose	0.010 U	µg/L	0.01	0.04
2/5/2018	Field Blank	Pesticides	Ametryn	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Butylate	0.019 U	µg/L	0.019	0.076
2/5/2018	Field Blank	Pesticides	Diazinon	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Naled	0.038 U	µg/L	0.038	0.15
2/5/2018	Field Blank	Pesticides	Triclopyr	0.0040 U	µg/L	0.004	0.016
2/5/2018	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Hexazinone	0.028 U	µg/L	0.028	0.11
2/5/2018	Field Blank	Pesticides	Metalaxyl	0.038 U	µg/L	0.038	0.15
2/5/2018	Field Blank	Pesticides	Norflurazon	0.028 U	µg/L	0.028	0.11
2/5/2018	Field Blank	Pesticides	Bentazon	8.0E-04 U	µg/L	0.0008	0.003
2/5/2018	Field Blank	Pesticides	Atrazine Desethyl	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Atrazine Desisopropyl	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Azinphos Methyl	0.019 U	µg/L	0.019	0.076
2/5/2018	Field Blank	Pesticides	Disulfoton	0.0047 U	µg/L	0.0047	0.019
2/5/2018	Field Blank	Pesticides	Fenamiphos	0.028 U	µg/L	0.028	0.11
2/5/2018	Field Blank	Pesticides	2,4-D	0.0020 U	µg/L	0.002	0.008
2/5/2018	Field Blank	Pesticides	Imidacloprid	0.0020 U	µg/L	0.002	0.008
2/5/2018	Field Blank	Pesticides	Bromacil	0.038 U	µg/L	0.038	0.15
2/5/2018	Field Blank	Pesticides	Ethoprop	0.0047 U	µg/L	0.0047	0.019
2/5/2018	Field Blank	Pesticides	Malathion	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Acetaminophen	0.0080 U	µg/L	0.008	0.032
2/5/2018	Field Blank	Pesticides	Carbamazepine	4.0E-04 U	µg/L	0.0004	0.002
2/5/2018	Field Blank	Pesticides	Chlorpyrifos Methyl	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Metolachlor	0.057 U	µg/L	0.057	0.23
2/5/2018	Field Blank	Pesticides	Parathion Methyl	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Simazine	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Pesticides	Fonofos	0.0095 U	µg/L	0.0095	0.038
2/5/2018	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	µg/L	1.9	7.5
2/5/2018	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8 U	µg/L	2.8	11
2/5/2018	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	µg/L	1.9	7.5
2/5/2018	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8 U	µg/L	2.8	11

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Hexachloroethane	2.8 U	µg/L	2.8	11
2/5/2018	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8 U	µg/L	2.8	11
2/5/2018	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.8 U	µg/L	2.8	11
2/5/2018	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	14 U	µg/L	14	56
2/5/2018	Field Blank	Priority Organic Pollutants	Benzidine	93 U	µg/L	93	370
2/5/2018	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Naphthalene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Pentachlorophenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 U	µg/L	2.8	11
2/5/2018	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	µg/L	1.9	7.5
2/5/2018	Field Blank	Priority Organic Pollutants	Acenaphthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Diethyl phthalate	1.9 U	µg/L	1.9	7.5
2/5/2018	Field Blank	Priority Organic Pollutants	Fluorene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	µg/L	1.9	7.5
2/5/2018	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	37 U	µg/L	37	150
2/5/2018	Field Blank	Priority Organic Pollutants	4-Nitrophenol	14 U	µg/L	14	56
2/5/2018	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	µg/L	1.9	7.5
2/5/2018	Field Blank	Priority Organic Pollutants	Fluoranthene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Isophorone	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Nitrobenzene	1.9 U	µg/L	1.9	7.5

Date Sampled	Site ID	Analysis Group	Component	Result	Units	MDL	PQL
2/5/2018	Field Blank	Priority Organic Pollutants	Pyrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.3 U	µg/L	9.3	37
2/5/2018	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Chrysene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Phenanthrene	0.19 U	µg/L	0.19	0.75
2/5/2018	Field Blank	Priority Organic Pollutants	Phenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.93 U	µg/L	0.93	3.7
2/5/2018	Field Blank	Priority Organic Pollutants	Anthracene	0.19 U	µg/L	0.19	0.75

EPA End Sheet

The Bioassay of Marsh Cove WWTF effluent sampled on February 5, 2018. NPDES #FL0032654.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0032654	11 12 180205	18 B	19 S	20 1

Remarks

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The Priority Pollutants Analysis of Marsh Cove WWTF effluent sampled on February 5, 2018. NPDES #FL0032654.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0032654	11 12 180205	18 X	19 S	20 1

Remarks

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Biological Analyses of Marsh Cove WWTF effluent sampled on February 5, 2018. NPDES #FL0032654.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0032654	11 12 180205	18 S	19 S	20 1

Remarks

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